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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/562,415	05/01/2006	Kathleen Delgrosso	08321-0148US1	3073

23973 7590 03/14/2008

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EXAMINER
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HORLICK, KENNETH R

ART UNIT	PAPER NUMBER
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1637

MAIL DATE	DELIVERY MODE
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03/14/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/562,415	<b>Applicant(s)</b> DELGROSSO ET AL.	
	<b>Examiner</b> Kenneth R. Horlick	<b>Art Unit</b> 1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-42 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-42 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/23/05;1/17/06;1/25/07</u> . | 6) <input type="checkbox"/> Other: ____.  |

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

2. Claims 6 and 15 are objected to because of the following informalities: claim 6 lacks a period, and claim 15 lacks a period and is missing a temperature unit for "105". Correction is required.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 9-14, 23, 24, 27, 39, and 40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A) Claim 9 is confusing because "the mutant target polynucleotide" lacks proper antecedent basis. Correction is required.

B) Claim 10-12 and 14 are confusing because "nucleic acid sequence variations" (plural) lacks proper antecedent basis, as claim 1 refers to a "nucleic acid sequence variation" (singular). Correction is required.

C) Claim 13 is confusing because it cannot be determined what is encompassed by “substantially the same melting temperature” and “under similar hybridization conditions”. Clarification is required for this relative language.

D) Claim 23 is confusing because of the language “prior to the ligase”. Clarification is required.

E) Claim 27 is confusing because “the treating step” lacks proper antecedent basis in claim 25 (it would appear dependency upon claim 26 is intended). Correction is required.

F) Claims 39 and 40 are confusing because they are drawn to a kit (i.e., a product), but the language “is attached...prior to performing an assay” and “are functionalized prior to attachment of the nanoparticle”, respectively, relates to a process. Thus, it is unclear how these claims are further limiting with respect to the claimed kit. Clarification is required.

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brenner et al. (US 5,846,719) in view of Mirkin et al. (US 2003/0211488)(provisional filing date of 05/07/02).

Claims 1-29 are drawn to methods comprising: carrying out a ligase detection reaction with one or more probe sets, each set comprising a first and second barcode; contacting ligation products with a solid support comprising an array; providing a third barcode carrying a detectable label and a nanoparticle, and detecting labeled captured ligation product. Claims 30-36 are drawn to a variation of this method wherein detection is facilitated by fourth and fifth barcodes. Claims 37-42 are drawn to kits for carrying out such methods, comprising: a plurality of ligation detection reaction probe sets comprising first and second barcodes; ligase reagents; and a third barcode.

Brenner et al. disclose an assay wherein adjacent hybridization probes are ligated on a target nucleic acid, and one of said probes has a "barcode" or sequence tag which is used to bind a hybridization complex to an array surface, which surface comprises a nucleic acid with the complement of the barcode (see Fig. 3 and columns 33-34).

Brenner et al. do not disclose a detection probe comprising a different barcode, a nanoparticle, and a detectable label; in Brenner et al., the other one of the ligation probes comprises a detectable label.

Mirkin et al. disclose the use of detection probes in sandwich hybridization assays, which probes comprise nanoparticles and dye labels useful with Raman detection systems (see entire document). Application to multiplexing is specifically taught in paragraph 0035, in Example 7 on page 12, and in Examples 11 and 12 on pages 14-15. Kits are disclosed in paragraph 0036.

One of ordinary skill in the art would have been motivated to modify the barcode-ligation detection reaction assay of Brenner et al. by using a detection system based on multiple barcodes, including detectable labels and nanoparticles, because Mirkin et al. disclosed the advantages of such a system with respect to sensitivity, selectivity, ratioing, and multiplexing capability (see abstract). The skilled artisan would have been further motivated to make kits for use in such a modified method by combining suitable reagents such as probes, ligase, and barcodes. It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to carry out the claimed methods, and to make and use the claimed kits.

5. No claims are free of the prior art.
6. Mirkin et al. (US 6,974,669) is made of record as a reference of interest.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth R. Horlick whose telephone number is 571-272-0784. The examiner can normally be reached on Monday-Thursday 6:30AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kenneth R Horlick/  
Primary Examiner, Art Unit 1637

02/28/08